

## Two new Western Australian species of *Drummondita* (Rutaceae: Boronieae) from banded ironstone ranges of the Yilgarn Craton

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### Abstract

Meissner, R.A. & Markey, A.S. Two new Western Australian species of *Drummondita* (Rutaceae: Boronieae) from banded ironstone ranges of the Yilgarn Craton. *Nuytsia* 17: 273–280 (2007). Two new species of *Drummondita* Harv. are described, both of which occur on rocky hillsides on the Yilgarn Craton of Western Australia. One of these, *D. fulva* A.S.Markey & R.A.Meissn., has close affinities to *D. microphylla* Paul G.Wilson but differs in having a reddish apiculus on the leaf apex, tawny new growth, and sub-orbicular, flattened sepals. The other, *D. rubroviridis* R.A.Meissn. is closely allied to *D. wilsonii* F.H.Mollemans, from which it is distinguished by a combination of spreading leaves, solitary, larger red flowers with green petal lobes, and a pointed apical leaf gland. *Drummondita fulva*, is relatively widespread, occurring on both Banded Iron Formation and associated metasedimentary rocks in the Yalgoo region, while *D. rubroviridis* has a restricted distribution and appears to be endemic to a single banded ironstone range in the Koolanooka Hills. A taxonomic description of these two new species, images and maps of their respective distributions are provided.

### Introduction

*Drummondita* Harv. (Rutaceae: Boronieae) is a genus of seven species endemic to Australia, many of which are rare and geographically restricted. The number of taxa in this genus has been expanding since Wilson (1971) reinstated *Drummondita* as a genus distinct from *Philotheca* Rudge. This paper describes two new species collected during Department of Environment and Conservation (DEC) flora surveys of greenstone and Banded Iron Formation (BIF) ranges in the Yilgarn Craton of Western Australia (Figure 1).

In a paper describing new taxa in *Drummondita*, Wilson (1998) referred to a collection from the Blue Hill Range (*R.J. Cranfield* 8586A, PERTH) as similar to *D. microphylla* Paul G.Wilson (note: in an editorial error *D. microphylla* was mistakenly referred to as *D. microcephala* in the notes section). This collection differed from the typical *D. microphylla* in leaf and floral characters. Wilson (1998) suggested that this variant may warrant recognition as a new taxon but did not describe it due to insufficient material being available. Recent flora surveys on the Blue Hills Range and adjacent BIF ranges in the Yalgoo-Paynes Find area (Markey & Dillon, in review) and in the Sandstone region (Meissner & Bayliss, unpublished data) have produced sufficient flowering and fruiting material to confirm that this taxon is distinct from *D. microphylla*. It is named here as *D. fulva* A.S.Markey & R.A.Meissn.

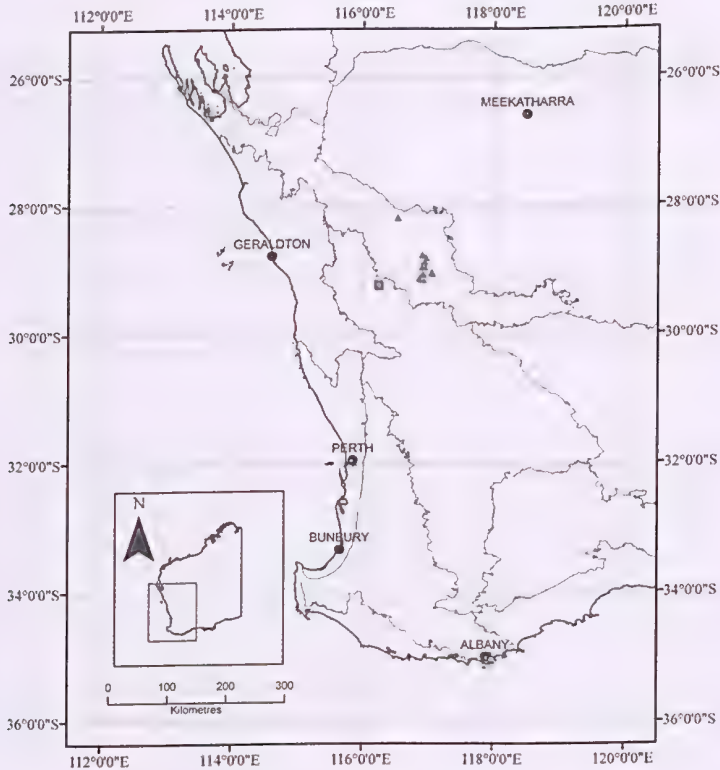


Figure 1. Distribution of *Drummondita fulva* (▲) and *D. rubroviridis* (■) in Western Australia.

During a concurrent survey of the Koolanooka Hills, a nearby ironstone range east of Morawa, a distinct new species of *Drummondita* was also discovered. Notably, this taxon has distinct red petals tipped with green and is named here as *D. rubroviridis* R.A.Meissn.

### Methods

This study was based on the examination of *Drummondita fulva*, *D. microcephala*, *D. rubroviridis*, and *D. wilsonii* Mollemans specimens lodged at the Western Australian Herbarium (PERTH). Vegetative, floral and seed measurements were made from dried herbarium specimens. Field observations were collated during DEC floristic surveys of BIF landforms. Descriptive terminology follows that of Wilson (1998). Precise localities are withheld due to conservation concerns. Distribution maps are based on the Interim Biogeographic Regionalisation for Australia (IBRA) Version 6.1 (Thackway & Cresswell 1995; Western Australian Herbarium 1998–; Environment Australia 2000; Department of Environment and Water Resources 2007) and were generated from records held at PERTH using ARCGIS v 9.0 (ESRI 2004).

## Taxonomy

### *Drummondita fulva* A.S.Markey & R.A.Meissn., sp. nov.

*Drummonditae microphyllae* Paul G.Wilson affinis sed ramulis nitido ligno-brunneis, apiculis foliorum rubro.

*Typus*: Karara Station, Western Australia [precise locality withheld for conservation purposes], 16 September 2005, A. Markey & S. Dillon 3359 (*holo*: PERTH 07349734).

*Shrubs* 0.5–1.5 m tall, erect, branching, ericoid. *Branchlets* glabrous, cuticle glossy and tawny when young, with short, raised, rounded, glandular-verrucose ridges decurrent from leaf bases. *Leaves* fleshy, green, clavate, crowded, with marginal ciliate hairs, sulcate above, glandular below, (1.6–)2–3.2(–3.6) mm long, 0.8–1.1 mm wide, with a terminal reddish brown apiculus; petiole to 0.5 mm. *Flowers* terminal, solitary, 10–17 mm long. *Pedicel* to 1.5 mm. *Sepals* unequal, sub-orbicular, (2.6–)3.2–4.5(–5.2) mm long; sparsely ciliate, otherwise glabrous, green, turning red with age; margin chartaceous. *Corolla* tubular; petals narrowly oblong-ovate, 9–14 mm, red. *Staminal tube* c. 10 mm long, with dense white silky hairs on the upper third, the hairs and tube turning red with age; anthers (1.2–)1.5–2.5 mm long. *Seeds* reniform, glossy, dark brown to black, with a white aril, 3–4 mm long, 1.5–2.4 mm wide. (Figures 2, 3)

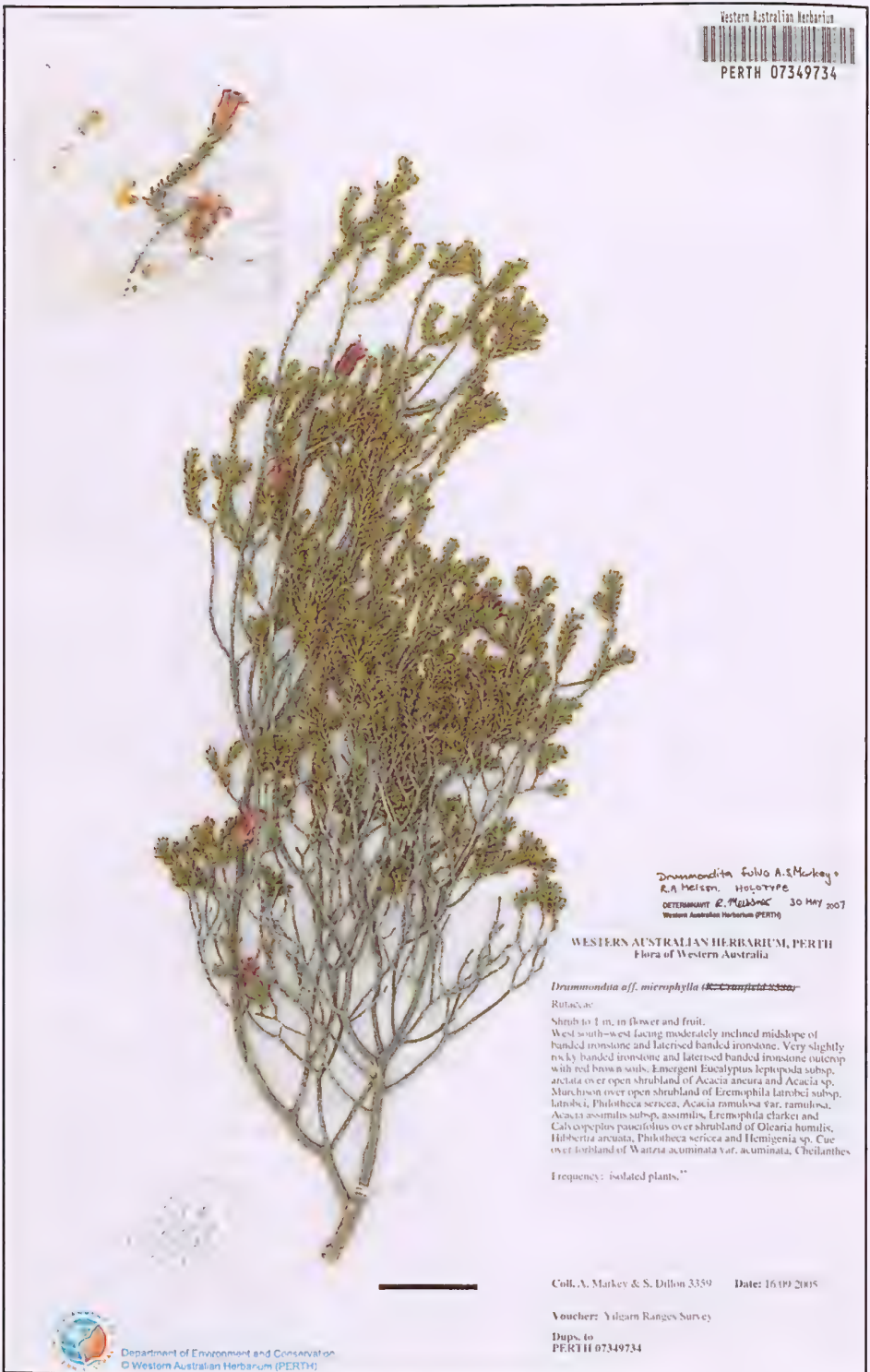
*Specimens examined*. WESTERN AUSTRALIA: [localities withheld] 22 Nov. 1992, R.J. Cranfield 8586A (PERTH 03024342); 18 Oct. 2005, A. Markey & S. Dillon 3356 (PERTH 07349769); 15 Oct. 2005, A. Markey & S. Dillon 3357 (PERTH 07349750); 11 Oct. 2005 A. Markey & S. Dillon 3358 (PERTH 07349742); 16 Sep. 2005, A. Markey & S. Dillon 3360 (PERTH 07349890); 18 Sep. 2005 A. Markey & S. Dillon 3361 (PERTH 07349882); 21 Oct. 2005, A. Markey & S. Dillon 3362 (PERTH 07349874); 19 Sep. 2005, A. Markey & S. Dillon 3363 (PERTH 07349866); 19 Aug. 1993, A.L. Payne 3804 (PERTH 4535693).

*Distribution and habitat*. This species is located in the Yalgoo Region of the Eremaean Botanical Province (Figure 3). *Drummondita fulva* generally occurs on the footslopes, lower slopes to upper slopes and hill crests of BIF and associated metasedimentary bedrock. It has been recorded on skeletal, shallow, acidic soils of orange-red or red-brown sandy loams and clayey silts. There is one record of *D. fulva* from the footslopes of a granite outcrop (A.L. Payne 3804).

*Drummondita fulva* is found in sparse to open tall shrublands dominated by *Acacia* (*A. sibina*, *A. ramulosa* var. *ramulosa*, *A. burkittii*, *A. aneura*, *A. sp.* Murchison (B.R. Maslin 1331), *A. aulacophylla*), *Allocasuarina acutivalvis*, *Melaleuca nematophylla* and *Calycopeplus paucifolius*. The lower shrub layer typically includes *Hibbertia arcuata*, *Philothea* spp. (*P. sericea* or *P. brucei*), *Aluta aspera* subsp. *hesperia* and *Eremophila latrobei*.

*Phenology*. Flowers and fruits from September to October.

*Conservation status*. Recently listed as Priority Three under DEC Conservation Codes for Western Australian Flora. Results from recent DEC flora surveys on the ironstone and greenstone ranges throughout the northern Yilgarn region (Markey & Dillon, in review; Markey, pers. obs.) suggest that this species is restricted to BIF hills between Perenjori, Paynes Find and Yalgoo (Figure 1). It is locally



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*Drummondia fulva* A.S. Markey & S. Dillon  
 R.A. Nelson Holotype  
 DETERMINANT: R. Melville 30 May 2007  
 Western Australian Herbarium (PERTH)

WESTERN AUSTRALIAN HERBARIUM, PERTH  
 Flora of Western Australia

*Drummondia* aff. *microphylla* (~~Acacia~~)  
 Rutaceae

Shrub to 1 m, in flower and fruit.  
 West-south-west facing moderately inclined midslope of banded ironstone and laterised banded ironstone. Very slightly rocky banded ironstone and laterised banded ironstone outcrop with red brown soils. Emergent Eucalyptus leptopoda subsp. atclata over open shrubland of Acacia aneura and Acacia sp. Marchion over open shrubland of Eremophila latrochi subsp. latrochi, Pholotheca sericea, Acacia rimulosa var. ramulosa, Acacia assimilis subsp. assimilis, Eremophila clarkeri and Calvocephalus paucifolius over shrubland of Olearia humilis, Hibbertia arcuata, Pholotheca sericea and Hemigenia sp. Cue over forbland of Wanzia acuminata var. acuminata, Cheilanthes  
 Frequency: isolated plants."

Coll. A. Markey & S. Dillon 3359 Date: 16/09/2005

Voucher: Yulgarn Ranges Survey  
 Dups. to  
 PERTH 07349734

Department of Environment and Conservation  
 Western Australian Herbarium (PERTH)

Figure 2. *Drummondia fulva* holotype (A. Markey & S. Dillon 3359), scale = 3 cm.

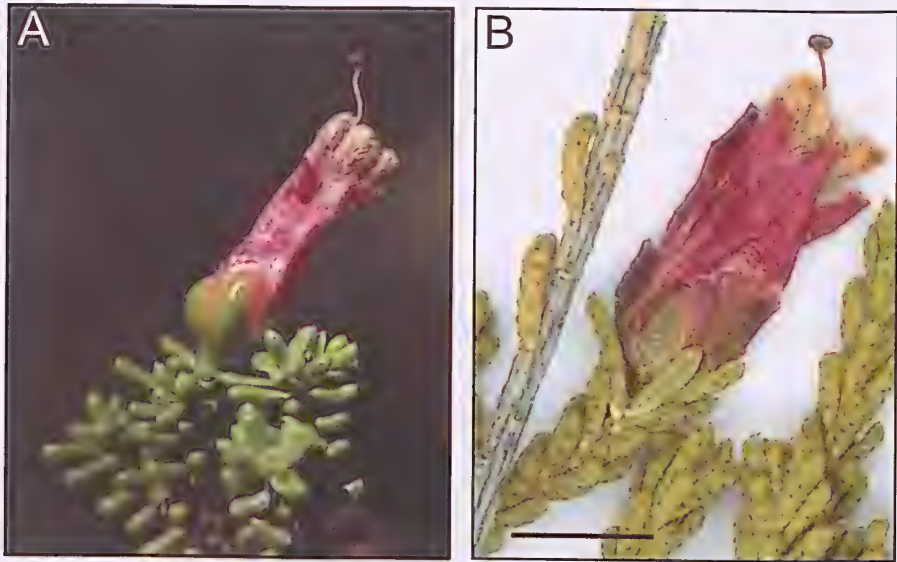


Figure 3. *Drummondita fulva*. A – flower, photograph by S. Dillon; B – scanned image of a portion of the holotype (A. Markey & S. Dillon 3359) showing a dried flower and the tawny branchlets, scale = 5 mm.

abundant within its range, but restricted to rocky hills and breakaways within a relatively small area. Many of these landforms are under mining and exploration tenements.

*Etymology.* The epithet is from the Latin *fulvus* (tawny), in reference to the tawny brown colour of the branchlets which distinguishes this taxon from *D. microphylla*.

*Affinities.* Closely related to *D. microphylla*, sharing the same leaf arrangement, size and shape as well as floral size and colour, but differs by the presence of glossy tawny branchlets, ciliate young leaves, reddish-brown leaf apiculus and sub-orbicular, flattened sepals.

*Notes.* The reddish brown colour of the leaf apiculus is not always evident on dried specimens but the combination of other distinguishing characters are consistent in their co-occurrence.

***Drummondita rubroviridis* R.A.Meissn., sp. nov.**

*Drummonditae wilsonii* Paul G. Wilson affinis sed foliis patentibus latioribus glande apicali acuta, floribus solitariis, calyce parviore, tubo florali longiore, et lobis petalorum viridibus differt.

*Typus:* Koolanooka Hills, Western Australia [precise locality withheld for conservation purposes], 12 October 2005, R. Meissner & Y. Caruso 67 (*holo:* PERTH 07356285).

*Drummondita* sp. Koolanooka Hills (R. Meissner & Y. Caruso 69), in FloraBase, <http://florabase.dec.wa.gov.au> [accessed 31 May 2007].

*Shrubs* 1.5m tall, erect, branching, straggly. *Branchlets* sparsely hairy when young, with long, raised, rounded, glandular-verrucose ridges decurrent from leaf bases, becoming prominent with age. *Leaves* green, linear-clavate, spreading, with marginal hairs, sulcate above, verrucose glandular below, 4.0–6.5(–9) mm long, 1.0–1.5 mm wide, mucronate with an apical gland; petiole to 0.5 mm. *Flowers* terminal, solitary, subsessile, 13–17 mm long. *Pedicel* to 1 mm long, fleshy. *Sepals* equal, ovate, 2.4–3.8 mm long, sparsely ciliate, otherwise glabrous, green, glandular, turning red with age; margin chartaceous. *Corolla* tubular; petals oblong-ovate, 11–15 mm long, red with green lobes, shortly ciliate. *Staminal tube* c. 15 mm long, with dense silky hairs on the upper third, the hairs and tube turning red with age; anthers 2.4–3.2 mm long. *Seeds* reniform with an end flattened, glossy, dark brown, with a white aril, 2.7–3.4 mm long, c. 1.6 mm wide. (Figures 4, 5)

*Specimens examined.* WESTERN AUSTRALIA: [localities withheld] 12 Oct. 2005, R. Meissner & Y. Caruso 66 (PERTH 07356277); 9 Oct. 2005, R. Meissner & Y. Caruso 68 (PERTH 07356269); 9 Oct. 2005, R. Meissner & Y. Caruso 69 (PERTH 07356293); 9 Oct. 2005, R. Meissner & Y. Caruso 70 (PERTH 07356250).

*Distribution and habitat.* This species is known only from the Koolanooka Hills, east of Morawa in the Avon Wheatbelt of the South West Botanical Province. The species is found in very low numbers on the slopes and crests of banded ironstone. It grows in sandy loam soil, in open mallee forests of *Eucalyptus ebbanoensis*, *Allocasuarina acutivalvis* and *Melaleuca* spp. over shrublands of *Acacia nigripilosa* subsp. *nigripilosa*, *Hibbertia* aff. *exasperata*, *Dodonaea scurra* and *Aluta aspera* subsp. *hesperia*.

*Phenology.* Flowers in September to October, with fruit recorded in October.

*Conservation status.* Recently listed as Priority One under DEC Conservation Codes for Western Australian Flora. Currently, this species is known only from the Koolanooka Hills (Figure 1), an area of approximately 3500 ha, that is under several mining and exploration tenements. Further targeted surveys are required to determine the endemism and population size of *D. rubroviridis*, owing to its low abundance and restricted distribution.

*Etymology.* The epithet is from the Latin *ruber* (red) and *viridis* (green), referring to the flower colour, which is predominantly red with the petal apices being green.

*Affinities.* *Drummondita rubroviridis* is allied to two restricted species: *D. wilsonii*, a Priority One species endemic to the Parker Range, c. 600 km southeast of Koolanooka; and *D. ericoides* Harv., a Declared Rare species found only on the Moresby Range north of Geraldton. These two species belong to the *D. ericoides* group along with *D. miniata* (C.A.Gardner) Paul G. Wilson. All of these species are found in similar habitats of rocky terrain and skeletal soils (Mollemans 1993).

*Drummondita rubroviridis* appears most similar to *D. wilsonii*, in having the same leaf shape, gland characters and floral colour, but differs in its spreading, wider leaves, pointed apical leaf gland, solitary flowers, smaller calyx, longer floral tube and green petal apices. *Drummondita ericoides* is also similar to *D. rubroviridis* in having solitary flowers and similar sized leaves that have terminal mucronate glands, but is distinguished by its crowded leaves, scattered leaf glands and yellow flower colour.

*Notes.* The green petal apices of *D. rubroviridis* can vary in intensity in the field. Colour can also fade on dried specimens (Figure 5B). *Drummondita rubroviridis* can be a cryptic plant due to the straggly habit and can be easily overlooked even when flowering.

Western Australian Herbarium  
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*Drummondita rubroviridis*  
R.A. Meissn. HOLOTYPE  
DETERMINANT R. Meissner 30 MAY 2007  
Western Australian Herbarium (PERTH)

WESTERN AUSTRALIAN HERBARIUM, PERTH  
Flora of Western Australia

*Drummondita* sp. Koolanooka Hills (R. Meissner and Y. Caruso 67)

Rutaceae

Shrub to 1.6m. Flowering

Last 1 km gently to moderately inclined mid-slope of banded ironstone and laterised banded ironstone and haematite. Slightly rocky laterised banded ironstone and haematite outcrop with yellow brown soils. Shrubland of *Melaleuca atrovirens*.

*Albessaurina acutivalvis* subsp. *princepiana* and *Eucalyptus ebbanensis* subsp. *glaucliraulia* over open shrubland of *Acacia nigripilosa* subsp. *nigripilosa* over open shrubland of *Hibbertia exasperata*, *Dodonaea* sp. Koolanooka Hills and *Acacia* sp. Koolanooka (falcate).

Frequency: isolated plants.

Coll. R. Meissner & Y. Caruso 67 Date: 12-10-2005

Voucher: Yilgarn Ranges Survey

Dups. to  
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Figure 4. *Drummondita rubroviridis* holotype (R. Meissner & Y. Caruso 67), scale = 3 cm.

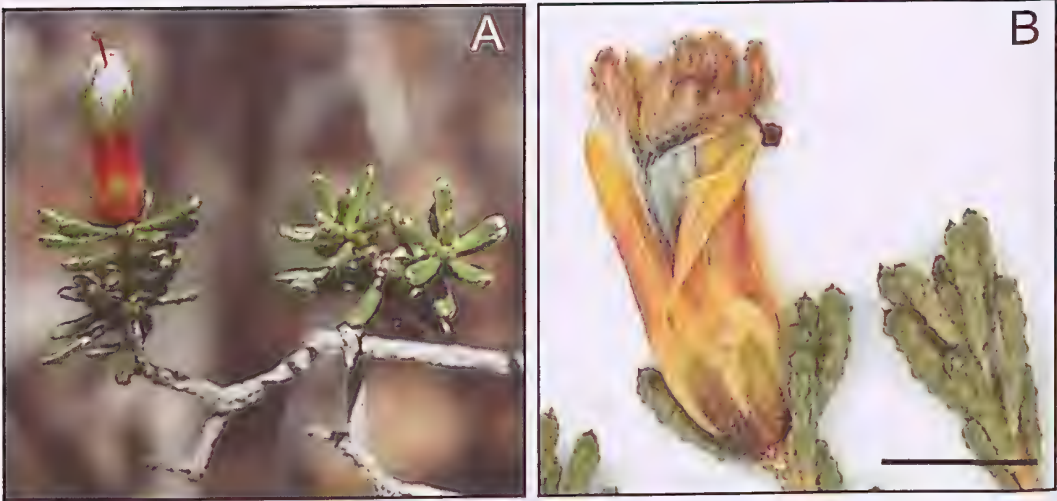


Figure 5. *Drummondita rubroviridis*. A – flower, photograph by R. A. Meissner; B – scanned image from a portion of the holotype (R. Meissner & Y. Caruso 67) showing a dried flower and the pointed apical leaf gland, scale = 5 mm.

### Acknowledgments

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### References

- Department of Environment and Water Resources (2007). IBRA Version 6.1. <http://www.environment.gov.au/parks/nrs/ibra/version6-1/index.html>. Updated 6<sup>th</sup> February 2007. [accessed 29 May 2007]
- Environment Australia (2000). Revision of the Interim Biogeographic Regionalisation for Australia (IBRA) and development of version 5.1 - summary report. <http://www.environment.gov.au/parks/nrs/ibra/version5-1/summary-report/index.html> [accessed on 31 May 2007]
- ESRI (2004). "ArcGIS v. 9.0. Computer software and documentation." (Redlands: California.) [Additional information at <http://www.esri.com/>]
- Markey, A.S. & Dillon, S.J. (in review). Flora and vegetation surveys of the Yilgarn Craton: the central Talling System. *Conservation Science Western Australia*.
- Mollemans, F.H. (1993). *Drummondita wilsonii*, *Philotheca langei* and *P. basistyla* (Rutaceae), new species from south-west Western Australia, *Nuytsia* 9(1): 95–109.
- Thackway, R. & Cresswell, I.D. (1995). "An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program." Version 4. (Australian Nature Conservation Agency: Canberra.)
- Western Australian Herbarium (1998–). FloraBase – The Western Australian Flora. Department of Environment and Conservation. <http://florabase.dec.wa.gov.au/> [accessed 31 May 2007]
- Wilson, P. (1971). Taxonomic notes on the family Rutaceae, principally of Western Australia. *Nuytsia* 1(2): 197–207.
- Wilson, P. (1998). Nomenclatural notes and new taxa in the genera *Asterolasia*, *Drummondita* and *Microcybe* (Rutaceae: Boroniaceae). *Nuytsia* 12(1): 83–88.